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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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11/19/2003

Caibin Xiao

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06/15/2005

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EXAMINER

VERBITSKY, GAIL KAPLAN

ART UNIT

PAPER NUMBER

2859

DATE MAILED: 06/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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EJ

<b>Office Action Summary</b>	Application No. 10/717,154	Applicant(s) XIAO ET AL.	
	Examiner Gail Verbitsky	Art Unit 2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 February 2005.  
 2a) ☒ This action is FINAL.                      2b) ☐ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 3-8, 11, 13, 19-24, 27, 29 and 35-38 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 3-8, 11, 13, 19-24, 27, 29 and 35-38 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:  
         1. ☐ Certified copies of the priority documents have been received.  
         2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
     \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>02/10/2005</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 3-4, 36-37 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes et al. (U.S. 4138878) [hereinafter Holmes].

Holmes discloses in Figs. 2-9 a device and a method in the field of applicant's endeavor. The device comprising providing a heat transfer reference surface/ element 68, a test/ fouling surface 70 to be immersed in a fluid environment. A meter 156 reads the difference in temperatures, which is representation of a heat flow/ flux between the surfaces and a deposit deposition/ fouling. During the foulant period, the reference surface stays at a temperature of an ambient fluid (at constant temperature and heat flux), and thus, is not fouled. Data representative of a heat flux between the surfaces is determined by  $Q_t - Q_r$  (col. 18, line 10), or (when modified by the Examiner)  $Q_t - 1 \times Q_r$ , or  $Q_t - C \times Q_r$ , wherein, it can be considered that  $C=1$ .

Holmes states that prior to measurements, the test surface is being cleaned (col. 18, lines 67-68). Also, Holmes states, that the meter can be calibrated in degrees of temperature, or by watts per square cm (heat flux density) or in thermal resistivity (col. 24, lines 65-68, col. 25, lines 1-2).

The temperature difference is measured by thermocouples attached to the surfaces.

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Holmes does not explicitly state that there is a pair of heat flux sensors. However, A) the fact that Holmes states, that the angular displacement of an output shaft of motor 310 indicates the difference in heat flux required to maintain the temperature difference at the test and the reference surfaces equal (Fig. 13 and col. 25, lines 41-61), would imply, that, by using the thermocouples, the heat flux could be obtained, furthermore, this would imply, that, in a broad sense, the thermocouples are acting as a pair of heat flux sensors.

B) also, it is very well known in the art, that thermocouples/ thermopiles (pair of thermocouples or more) could be used as heat flux/ flow sensors.

With respect to claim 37: the use of the particular fluid/ material to clean the reference surface, i.e., generation of acid reagents, as stated in claim 37, absent any criticality, is only considered to be the "optimum" fluid that a person having ordinary skill in the art at the time the invention was made using routine experimentation would have found obvious to provide for cleansing the reference surface of Holmes since it has been held to be a matter of obvious design choice and within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use of the invention. In re Leshin, 125 USPQ 416.

The method steps will be met during the normal operation of the device stated above.

3. Claims 5-8 and 11, 13, 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes in view of French (U.S. 6575662).

Holmes discloses the device/ method, as stated above in paragraph 2.

Although Holmes teaches that both surfaces should be cleaned and the foulant removed before the test, Holmes does not explicitly teach to use a mechanical brushing to remove foulant.

French teaches that foulant could be removed by using a mechanical brushing or sonic or chemical cleansing procedures.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a mechanical brushing to clean the reference surface (and the transfer surface) before the test, as taught by French, so as to provide a clean reference surface ensuring more accurate results of measurements by comparing the heat transfer surface to a foulant free surface.

With respect to claims 11, 13, 38: the use of the particular fluid/ material to clean the reference surface, i.e., non-fouling deionized water, synthetic cooling fluid, combination of the fluid exiting the fouling tube and antifouling chemicals, as stated in claims 11, 13, or clean by an acid solution, as stated in claim 38, absent any criticality, is only considered to be the "optimum" fluid that a person having ordinary skill in the art at the time the invention was made using routine experimentation would have found obvious to provide for cleansing the reference surface of Holmes since it has been held to be a matter of obvious design choice and within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use of the invention. In re Leshin, 125 USPQ 416.

The method steps will be met during the normal operation of the device stated above.

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4. Claims 21-24, 27, 29 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes and French as applied to claims 5-8, 11, 13, 38 above, and further in view of Hays.

Holmes and French disclose the device/ method as stated above in paragraph 3.

They do not explicitly teach the limitations of claims 21-24, 27, 29.

Hays teaches a device in the field of applicant's endeavor wherein a microprocessor is used to determine a fouling.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the meter, disclosed by Holmes and French, with the microprocessor, as taught by Hays, so as to provide more accurate results by using more accurate electronic evaluating device.

The method steps will be met during the normal operation of the device stated above.

5. Claim 35 is finally rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes in view of Diller et al. (U.S. 4779994) [hereinafter Diller].

Holmes discloses the device/ method as stated above in paragraph 2.

Holmes does not explicitly teach that the heat flux sensors are thin film heat flux sensors, as stated in claim 35.

Diller discloses a device in the field of applicant's endeavor, wherein the heat flux sensor is a thin film heat flux sensor applied to a surface of interest.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to the sensors, disclosed by Holmes, with the thin film heat

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flux sensors, as taught by Diller, so as to make the sensor of a lesser size and easily attachable to the surface of interest for more accurate results of measurements.

The method steps will be met during the normal operation of the device stated above.

6. Claims 19-20 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Holmes in view of Hays.

Holmes discloses the device/ method as stated above in paragraph 3.

They do not explicitly teach the limitations of claims 19-20.

Hays teaches a device in the field of applicant's endeavor wherein a microprocessor is used to determine a fouling.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the meter, disclosed by Holmes,, with the microprocessor, as taught by Hays, so as to provide more accurate results by using more accurate electronic evaluating device.

The method steps will be met during the normal operation of the device stated above.

### ***Response to Arguments***

7. Applicant's arguments filed on February 10, 2005 have been fully considered but they are not persuasive.

With respect to WO: the arguments are now moot.

With respect to Holmes: Applicant states that Holmes does not teach heat flux sensors that Holmes uses thermocouples to indirectly obtain heat flux data, while the present invention uses heat flux sensors to directly measure heat flux. This argument is not

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persuasive because, thermocouples are very well known to measure heat flux by measuring temperature (also, please see Wynnyckyj et al. below), converting the temperature in the heat flux unit is simply the matter of a soft/ firmware of the microprocessor or other processing device used (see, for example a simple thermometer where the temperature can be seen in a centigrade scale and in Fahrenheit scale at the same time due to a simple conversion). Also, in the claims, applicant has never claimed the particular, direct, heat flux measurements. Therefore, this argument is not persuasive because this limitation is not stated in the claim. It is the claims that define the claimed invention, and it is claims, not specification that are anticipated or unpatentable. Constant v. Advanced Micro-Devices, Inc., 7 USPQ2d 1064.

Applicant states that the instant invention is free of complicated feedback circuit of Holmes. This argument is not persuasive because, in response to Applicant's argument that the reference includes an additional structure (feature) not required by Applicant's invention, it must be noted that the reference discloses the invention as claimed. The fact that it discloses additional structure (feature) not claimed by Applicant is irrelevant.

### ***Conclusion***

**7. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not



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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in the PTO-892 and not mentioned above disclose related devices and methods.

***Pompei (U.S. 6219573) teaches that a thermopile (couple or more thermocouples) could be used for measuring heat flux).***

***Wynnyckyj et al. (U.S. 4408568) discloses a device in the field of applicant's endeavor wherein heat flux sensors can be thermocouples (Fig. 4 and col. 4, lines 46-49).***

Any inquiry concerning this communication should be directed to the Examiner Verbitsky who can be reached at (571) 272-2253 Monday through Friday 8:00 to 4:00 ET.

GKV

Gail Verbitsky

Primary Patent Examiner, TC 2800



June 08, 2005